



Project: Mesa County, CO  
 Site: Nichols 24-07 Pad  
 Well: Nichols 0994-24-12E  
 Wellbore: Wellbore #1  
 Design: Design #1  
 Latitude: 39.263344  
 Longitude: -107.830831  
 Ground Level: 7212.0  
 well @ 7242.0usft (H&P #522)



**PROJECT DETAILS: Mesa County, CO**

Geodetic System: US State Plane 1983  
 Datum: North American Datum 1983  
 Ellipsoid: GRS 1980  
 Zone: Colorado Central Zone  
 System Datum: Mean Sea Level

**REFERENCE INFORMATION**

Co-ordinate (N/E) Reference: Well Nichols 0994-24-12E, True North  
 Vertical (TVD) Reference: well @ 7242.0usft (H&P #522)  
 Section (V/S) Reference: Slot - (0.0N, 0.0E)  
 Measured Depth Reference: well @ 7242.0usft (H&P #522)  
 Calculation Method: Minimum Curvature

**WELL DETAILS: Nichols 0994-24-12E**

Ground Level: 7212.0		Latitude	Longitude
+N-S 0.0	+E-W 0.0	39.263344	-107.830831
Northings 1528272.41	Eastings 2340136.63		

**WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)**

Name	TVD	+N-S	+E-W	Northings	Eastings	Latitude	Longitude
PBHL - Nichols 0994-24-12E	7467.0	-430.1	1389.9	1528806.80	2341515.07	39.262163	-107.825922

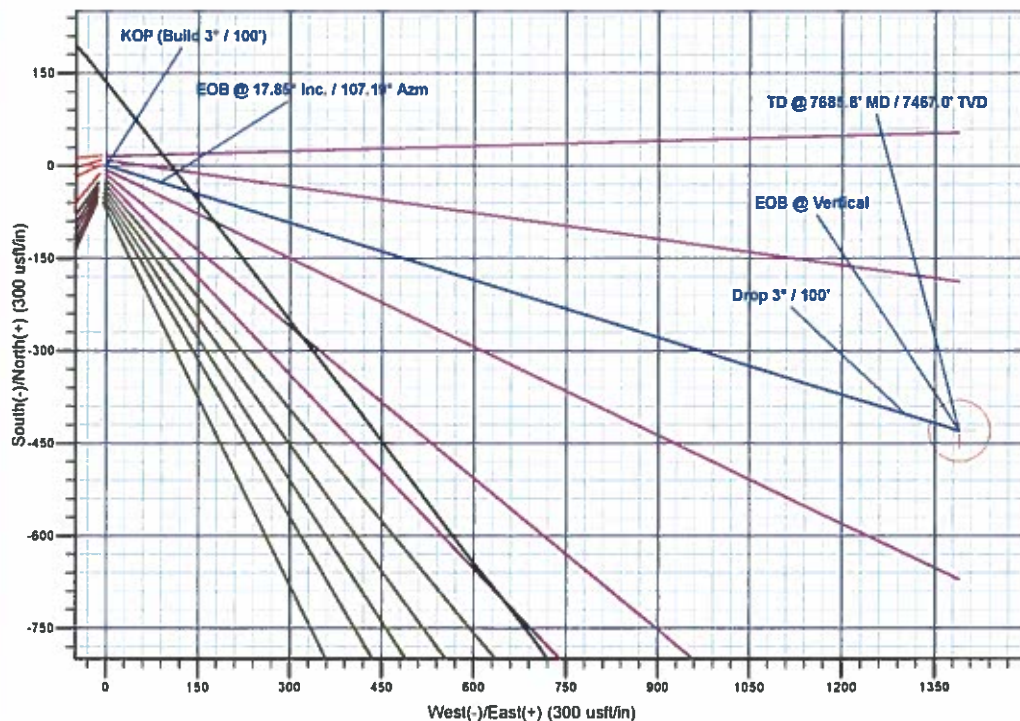
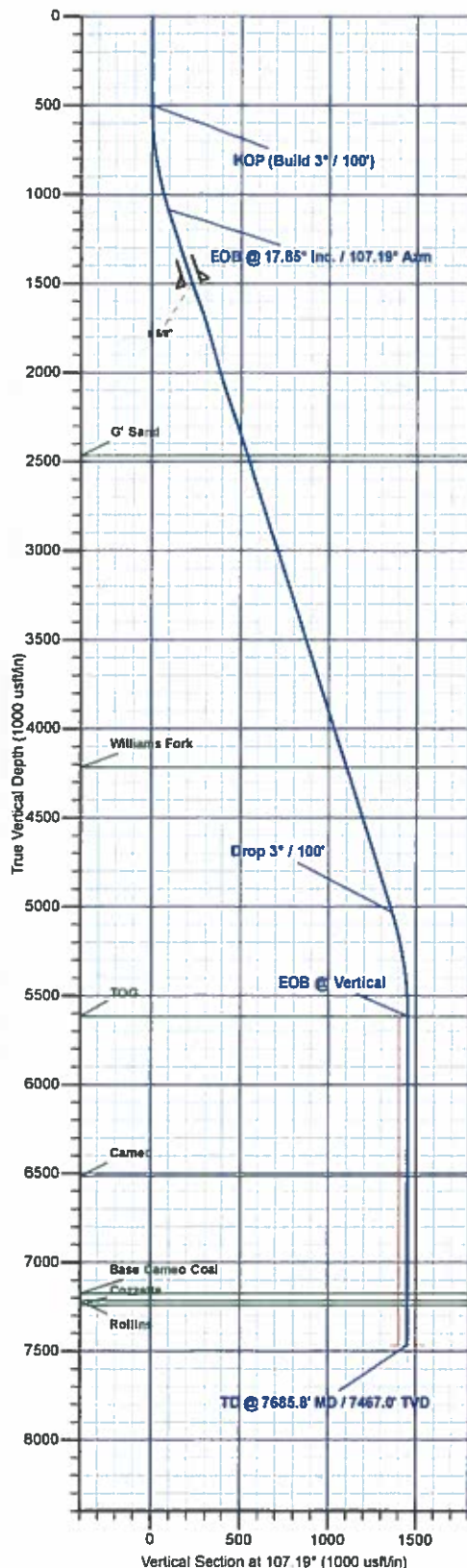
**SECTION DETAILS**

MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSect	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3' / 100')
1085.1	17.85	107.19	1085.5	-27.2	87.9	3.00	107.19	82.0	EOB @ 17.85° Inc. / 107.19° Azm
5240.7	17.85	107.19	5031.5	-482.9	1302.1	0.00	0.00	1363.0	Drop 3' / 100'
5835.8	0.00	0.00	5617.0	-430.1	1389.9	3.00	188.00	1454.9	EOB @ Vertical
7685.8	0.00	0.00	7467.0	-430.1	1389.9	0.00	0.00	1454.9	TD @ 7685.8' MD / 7467.0' TVD



**FORMATION TOP DETAILS**

TVDPath	MDPath	Formation
2467.0	2548.5	G' Sand
4217.0	4388.0	Williams Fork
5617.0	5835.8	TOG
6517.0	6735.5	Cameo
7177.0	7395.8	Base Cameo Coal
7217.0	7435.8	Rollins
7242.0	7460.5	Corcoran
7242.0	7460.5	Cozzette



Plan: Design #1 (Nichols 0994-24-12E/Wellbore #1)

Created By: Will Jircik Date: 15:56, March 10 2017



# **Laramie Energy, LLC**

**Mesa County, CO  
Nichols 24-07 Pad  
Nichols 0994-24-12E**

**Wellbore #1**

**Plan: Design #1**

## **QES Well Planning Report**

**10 March, 2017**





## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Nichols 0994-24-12E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7242.0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7242.0usft (H&P #522)
<b>Site:</b>	Nichols 24-07 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Nichols 0994-24-12E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

<b>Project</b>	Mesa County, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		

<b>Site</b>	Nichols 24-07 Pad			
<b>Site Position:</b>		<b>Northing:</b>	1,529,213.07 usft	<b>Latitude:</b> 39.263181
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,340,128.94 usft	<b>Longitude:</b> -107.830853
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16"	<b>Grid Convergence:</b> -1.47°

<b>Well</b>	Nichols 0994-24-12E			
<b>Well Position</b>	+N/-S	59.5 usft	<b>Northing:</b>	1,529,272.41 usft
	+E/-W	6.2 usft	<b>Easting:</b>	2,340,138.64 usft
<b>Position Uncertainty</b>	0.0 usft		<b>Wellhead Elevation:</b>	0.0 usft
			<b>Ground Level:</b>	7,212.0 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	3/9/2017	9.63	65.43	51,445

<b>Design</b>	Design #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	107.19

<b>Plan Sections</b>										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,095.1	17.85	107.19	1,085.5	-27.2	87.9	3.00	3.00	0.00	107.19	
5,240.7	17.85	107.19	5,031.5	-402.9	1,302.1	0.00	0.00	0.00	0.00	
5,835.8	0.00	0.00	5,617.0	-430.1	1,389.9	3.00	-3.00	0.00	180.00	
7,685.8	0.00	0.00	7,467.0	-430.1	1,389.9	0.00	0.00	0.00	0.00	PBHL - Nichols 0994-





## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Nichols 0994-24-12E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7242.0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7242.0usft (H&P #522)
<b>Site:</b>	Nichols 24-07 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Nichols 0994-24-12E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

## Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>KOP (Build 3° / 100')</b>									
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	3.00	107.19	600.0	-0.8	2.5	2.6	3.00	3.00	0.00
700.0	6.00	107.19	699.6	-3.1	10.0	10.5	3.00	3.00	0.00
800.0	9.00	107.19	798.8	-7.0	22.5	23.5	3.00	3.00	0.00
900.0	12.00	107.19	897.1	-12.3	39.9	41.7	3.00	3.00	0.00
1,000.0	15.00	107.19	994.3	-19.2	62.2	65.1	3.00	3.00	0.00
<b>EOB @ 17.85° Inc. / 107.19° Azm</b>									
1,095.1	17.85	107.19	1,085.5	-27.2	87.9	92.0	3.00	3.00	0.00
1,100.0	17.85	107.19	1,090.2	-27.6	89.3	93.5	0.00	0.00	0.00
1,200.0	17.85	107.19	1,185.4	-36.7	118.6	124.1	0.00	0.00	0.00
1,300.0	17.85	107.19	1,280.5	-45.8	147.9	154.8	0.00	0.00	0.00
1,400.0	17.85	107.19	1,375.7	-54.8	177.2	185.4	0.00	0.00	0.00
1,500.0	17.85	107.19	1,470.9	-63.9	206.4	216.1	0.00	0.00	0.00
<b>8 5/8"</b>									
1,530.0	17.85	107.19	1,499.5	-66.6	215.2	225.3	0.00	0.00	0.00
1,600.0	17.85	107.19	1,566.1	-72.9	235.7	246.8	0.00	0.00	0.00
1,700.0	17.85	107.19	1,661.3	-82.0	265.0	277.4	0.00	0.00	0.00
1,800.0	17.85	107.19	1,756.5	-91.1	294.3	308.1	0.00	0.00	0.00
1,900.0	17.85	107.19	1,851.7	-100.1	323.6	338.7	0.00	0.00	0.00
2,000.0	17.85	107.19	1,946.8	-109.2	352.9	369.4	0.00	0.00	0.00
2,100.0	17.85	107.19	2,042.0	-118.3	382.2	400.1	0.00	0.00	0.00
2,200.0	17.85	107.19	2,137.2	-127.3	411.5	430.7	0.00	0.00	0.00
2,300.0	17.85	107.19	2,232.4	-136.4	440.8	461.4	0.00	0.00	0.00
2,400.0	17.85	107.19	2,327.6	-145.5	470.0	492.0	0.00	0.00	0.00
2,500.0	17.85	107.19	2,422.8	-154.5	499.3	522.7	0.00	0.00	0.00
<b>G' Sand</b>									
2,546.5	17.85	107.19	2,467.0	-158.7	513.0	536.9	0.00	0.00	0.00
2,600.0	17.85	107.19	2,517.9	-163.6	528.6	553.4	0.00	0.00	0.00
2,700.0	17.85	107.19	2,613.1	-172.6	557.9	584.0	0.00	0.00	0.00
2,800.0	17.85	107.19	2,708.3	-181.7	587.2	614.7	0.00	0.00	0.00
2,900.0	17.85	107.19	2,803.5	-190.8	616.5	645.3	0.00	0.00	0.00
3,000.0	17.85	107.19	2,898.7	-199.8	645.8	676.0	0.00	0.00	0.00
3,100.0	17.85	107.19	2,993.9	-208.9	675.1	706.7	0.00	0.00	0.00
3,200.0	17.85	107.19	3,089.0	-218.0	704.4	737.3	0.00	0.00	0.00
3,300.0	17.85	107.19	3,184.2	-227.0	733.7	768.0	0.00	0.00	0.00
3,400.0	17.85	107.19	3,279.4	-236.1	762.9	798.6	0.00	0.00	0.00
3,500.0	17.85	107.19	3,374.6	-245.1	792.2	829.3	0.00	0.00	0.00
3,600.0	17.85	107.19	3,469.8	-254.2	821.5	859.9	0.00	0.00	0.00
3,700.0	17.85	107.19	3,565.0	-263.3	850.8	890.6	0.00	0.00	0.00
3,800.0	17.85	107.19	3,660.2	-272.3	880.1	921.3	0.00	0.00	0.00
3,900.0	17.85	107.19	3,755.3	-281.4	909.4	951.9	0.00	0.00	0.00
4,000.0	17.85	107.19	3,850.5	-290.5	938.7	982.6	0.00	0.00	0.00
4,100.0	17.85	107.19	3,945.7	-299.5	968.0	1,013.2	0.00	0.00	0.00
4,200.0	17.85	107.19	4,040.9	-308.6	997.3	1,043.9	0.00	0.00	0.00
4,300.0	17.85	107.19	4,136.1	-317.7	1,026.5	1,074.6	0.00	0.00	0.00
<b>Williams Fork</b>									
4,385.0	17.85	107.19	4,217.0	-325.4	1,051.4	1,100.6	0.00	0.00	0.00
4,400.0	17.85	107.19	4,231.3	-326.7	1,055.8	1,105.2	0.00	0.00	0.00



## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Nichols 0994-24-12E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7242 0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7242 0usft (H&P #522)
<b>Site:</b>	Nichols 24-07 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Nichols 0994-24-12E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,500.0	17.85	107.19	4,326.4	-335.8	1,085.1	1,135.9	0.00	0.00	0.00
4,600.0	17.85	107.19	4,421.6	-344.8	1,114.4	1,166.5	0.00	0.00	0.00
4,700.0	17.85	107.19	4,516.8	-353.9	1,143.7	1,197.2	0.00	0.00	0.00
4,800.0	17.85	107.19	4,612.0	-363.0	1,173.0	1,227.9	0.00	0.00	0.00
4,900.0	17.85	107.19	4,707.2	-372.0	1,202.3	1,258.5	0.00	0.00	0.00
5,000.0	17.85	107.19	4,802.4	-381.1	1,231.6	1,289.2	0.00	0.00	0.00
5,100.0	17.85	107.19	4,897.5	-390.2	1,260.9	1,319.8	0.00	0.00	0.00
5,200.0	17.85	107.19	4,992.7	-399.2	1,290.1	1,350.5	0.00	0.00	0.00
<b>Drop 3° / 100'</b>									
5,240.7	17.85	107.19	5,031.5	-402.9	1,302.1	1,363.0	0.00	0.00	0.00
5,300.0	16.07	107.19	5,088.2	-408.0	1,318.6	1,380.3	3.00	-3.00	0.00
5,400.0	13.07	107.19	5,185.0	-415.5	1,342.6	1,405.4	3.00	-3.00	0.00
5,500.0	10.07	107.19	5,282.9	-421.4	1,361.8	1,425.5	3.00	-3.00	0.00
5,600.0	7.07	107.19	5,381.8	-425.8	1,376.0	1,440.4	3.00	-3.00	0.00
5,700.0	4.07	107.19	5,481.3	-428.7	1,385.3	1,450.1	3.00	-3.00	0.00
5,800.0	1.07	107.19	5,581.2	-430.0	1,389.6	1,454.6	3.00	-3.00	0.00
<b>EOB @ Vertical - TOG</b>									
5,835.8	0.00	0.00	5,617.0	-430.1	1,389.9	1,454.9	3.00	-3.00	-299.30
5,900.0	0.00	0.00	5,681.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
6,000.0	0.00	0.00	5,781.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
6,100.0	0.00	0.00	5,881.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
6,200.0	0.00	0.00	5,981.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
6,300.0	0.00	0.00	6,081.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
6,400.0	0.00	0.00	6,181.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
6,500.0	0.00	0.00	6,281.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
6,600.0	0.00	0.00	6,381.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
6,700.0	0.00	0.00	6,481.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
<b>Cameo</b>									
6,735.8	0.00	0.00	6,517.0	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
6,800.0	0.00	0.00	6,581.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
6,900.0	0.00	0.00	6,681.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
7,000.0	0.00	0.00	6,781.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
7,100.0	0.00	0.00	6,881.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
7,200.0	0.00	0.00	6,981.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
7,300.0	0.00	0.00	7,081.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
<b>Base Cameo Coal</b>									
7,395.8	0.00	0.00	7,177.0	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
7,400.0	0.00	0.00	7,181.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
<b>Rollins</b>									
7,435.8	0.00	0.00	7,217.0	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
<b>Cozzette - Corcoran</b>									
7,460.8	0.00	0.00	7,242.0	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
7,500.0	0.00	0.00	7,281.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
7,600.0	0.00	0.00	7,381.2	-430.1	1,389.9	1,454.9	0.00	0.00	0.00
<b>TD @ 7685.8' MD / 7467.0' TVD - TD</b>									
7,685.8	0.00	0.00	7,467.0	-430.1	1,389.9	1,454.9	0.00	0.00	0.00



## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Nichols 0994-24-12E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7242.0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7242.0usft (H&P #522)
<b>Site:</b>	Nichols 24-07 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Nichols 0994-24-12E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

## Design Targets

## Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- Shape									
PBHL - Nichols 0994-24	0.00	0 00	7,467.0	-430.1	1,389.9	1,528,806.80	2,341,515.07	39 262163	-107.825922
- plan hits target center									
- Point									

## Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,530.0	1,499.5	8 5/8"	8-5/8	11

## Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,546.5	2,467.0	G' Sand			
4,385.0	4,217.0	Williams Fork			
5,835.8	5,617.0	TOG			
6,735.8	6,517.0	Cameo			
7,395.8	7,177.0	Base Cameo Coal			
7,435.8	7,217.0	Rollins			
7,460.8	7,242.0	Cozzette			
7,460.8	7,242.0	Corcoran			
7,685.8	7,467.0	TD			

## Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
500.0	500.0	0.0	0.0	KOP (Build 3" / 100')
1,095.1	1,085.5	-27.2	87.9	EOB @ 17.85° Inc. / 107.19° Azm
5,240.7	5,031.5	-402.9	1,302.1	Drop 3" / 100'
5,835.8	5,617.0	-430.1	1,389.9	EOB @ Vertical
7,685.8	7,467.0	-430.1	1,389.9	TD @ 7685.8' MD / 7467.0' TVD